

Applicants: Chul-Ho LIM and Soo-Yen LIM  
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Remarks

Claims 1 and 4 were pending in this application. Claim 1 has been amended. Accordingly, claims 1 and 4 are presently being examined.

Applicants hereinabove have amended claim 1 to more clearly recite the subject matter of the invention and to place claim 1 in better condition for allowance by: (1) deleting the words "characterized by" and the corresponding "and"; (2) by reciting that the replaceable modular system board is "mounted within the flat panel display device" (emphasis added). Support for this amendment can be found, inter alia, in Fig. 4 and on page 10 in lines 22-25 of the subject specification.

Sections 2-4 of the Office Action rejected claims 1 and 4 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,606,088 to Yang et al. ("Yang patent") in view of U.S. Patent No. 6,512,670 to Boehme ("Boehme patent").

According to the Office Action, the Yang patent teaches all the limitations of the invention recited in claim 1 for a flat panel display driver except for a first connector, a second connector, a replaceable module system board, a chassis, and an insertion slot, but that the Boehme patent teach these limitations for a laptop computer and camcorder, and accordingly, a person of ordinary skill in the art at the time of the invention would combine the teachings of the Yang patent and the Boehme patent to obtain a field replaceable unit.

Applicants respectfully submit that the purpose of the subject invention is to provide a "replaceable modular system board" structured to be "separably mounted within the flat panel display device", as recited in amended claim 1, for easily changing the

display function of the flat panel display device. In other words, by simply replacing one modular system board in the flat panel display device with a new one corresponding to a desired function or application, the display function of the flat panel display device can be changed, see page 1, lines 6-13 of the subject specification.

In contrast to the subject invention recited in amended claim 1, the Yang patent discusses: (1) integrating various interface circuits to receive various types of video data; and (2) then selecting the desired video data from the various types. To achieve this purpose, the Yang patent provides a liquid crystal display ("LCD") panel with a signal processor for receiving any and all of the plurality of types of video signals, see column 1, lines 53-57, and column 2, lines 4-7 of the Yang patent. In other words, unlike the Yang patent which does not allow for modular replacement of its signal processor for new or different functionality, the subject invention teaches and recites in amended claim 1, a replaceable modular system board that can be changed to provide new or different functionality.

The ability to change the system board of the flat panel display device taught by the subject invention enables a user to use one display for a long time with new or different applications or device types such as personal computers or televisions. Using the subject invention recited in amended claim 1, any user who wants to link the flat panel display device to a different device type need only remove the previous modular system board and insert a modular system board corresponding to the changed application or device type through the insertion slot into the same flat panel display device. The Yang patent fails to teach or suggest such replacement.

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Although the Office Action states that the Boehme patent teaches such a replaceable "modular board", applicants respectfully submit that the first connector, second connector, insertion slot and chassis taught by the subject invention and recited in amended claim 1 demonstrate the difference between the detachable display of the Boehme patent and the replaceable modular system board of the subject invention.

In general, the Boehme patent relates to a connection between a portable electronic device acting as a main central processing unit ("CPU") system, for example, a personal or laptop computer, a camcorder, or a personal video device such as a television or digital video disc ("DVD") player, see column 1, lines 5-16 of the Boehme patent, and a detachable display. In contrast, the subject invention as recited in amended claim 1 relates to the connection between a display device and a modular board inserted within the display device. Nowhere in the Boehme patent or the Yang patent is there any teaching or suggestion of a modular board mounted within a flat panel display device. In other words, the Boehme patent relates to attaching/detaching a display unit to/from portable electronic devices, while the subject invention teaches replacing a modular system board within a display device; a difference further indicated in claim 1 with respect to the recitation of the first connector, the second connector, the chassis and the insertion slot.

More specifically, according to the Office Action, the Boehme patent, as shown in Fig. 6 of the Boehme patent, provides a first connector (the video signal cable connecting to the LCD display 28) and a second connector (the power cables connecting from CPU 25, and the video signal cables connecting from CPU 26). However, applicants respectfully submit that the video signal cables and the

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power cables are clearly provided only to connect the detachable display to the portable electronic device. Indeed, some of the video signal cables are in the detachable display 11 while the other cables, and the power cables, are on the portable electronic device (CPU) 12 of the Boehme patent device. In contrast, the subject invention recited in amended claim 1 provides that "all components" of the flat panel display including the first connector 150 and second connector 155 are clearly inside the chassis 82 of the flat panel display, see Fig. 4 of the subject specification.

In other words, since the circuitry of a modular system board mounted within a flat panel display device is specially designed to be different from a detachable display for a portable electronic device, there are significant differences in electrical and technical arrangements between the connectors recited in amended claim 1 and the cables of the Boehme patent cited in the Office Action.

The Office Action also states that the Boehme patent, as shown in Fig. 6 of the Boehme patent, has an insertion slot (slot 22) and a chassis (CPU 12) for containing a replaceable modular system board, that is, the chassis of the portable electronic device itself. However, applicants respectfully submit that in contrast to the Boehme patent, the subject invention provides, as recited in amended claim 1, a flat panel display device with a chassis that is adapted to "fix and clamp all components of the flat panel display device" including the replaceable modular system board. The cited 'chassis' of the Boehme patent clearly does not fix and clamp all the components of the detachable display, but only the components of the portable electronic device. Indeed, the cited 'chassis' of the Boehme patent does not provide a space large enough to hold all the components of the detachable display 11 inside, and instead

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attaches most or all of the components of the detachable display 11 outside the cited 'chassis'.

In other words, the insertion slot taught by the subject invention and recited in amended claim 1 requires a prearranged large space within the flat panel display device's chassis to accommodate the replaceable modular system board. In the subject invention and as recited amended claim 1, this required space within the flat panel display device is made available by moving many components of the flat panel display device to the separate, replaceable modular system board, such as the "analog/digital converter", the "image processor", and the "low voltage differential signaling unit". Neither the Yang patent nor the Boehme patent teach or suggest moving these components to a separate board.

Additionally, the Office Action states that the Boehme patent has a replaceable modular system board, as shown in Figs. 6 and 13a and as discussed in column 5, lines 35-61 of the Boehme patent. However, applicants respectfully submit the replaceable modular system board taught by the subject invention and recited in amended claim 1 is unique in design and function, and is not disclosed in the Yang patent or the Boehme patent, whether taken alone or in combination. More specifically, the subject invention teaches and recites in amended claim 1 that:

(1) the separate, replaceable modular system board includes key components of the display function of the flat panel display device such as the "analog/digital converter", the "image processor", and the "low voltage differential signaling unit"; and

(2) the replaceable modular system board can be mounted "within the flat panel display device" in a one-shot mode by simply connecting the replacement modular board through an insertion slot

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in the chassis.

In other words, within the display devices of the Yang patent or the Boehme patent, no portion of the display function is changeable in a one-shot mode by changing the modular system board having key components and mounted through an insertion slot into the flat panel display device. Thus, neither the Yang patent nor the Boehme patent, taken alone or in combination, disclose anything similar to the replaceable modular system board mounted within the flat panel display device recited in amended claim 1.

Indeed, were one to combine the Yang patent and the Boehme patent, while the entire detachable display becomes a consumer field replaceable unit which may lower cost and service time, see column 1, lines 46-51 of Boehme patent, the entire detachable display unit needs to be replaced for a new or different application requiring a display function not supported by the circuitry of the detachable display unit. In contrast, as taught by the subject invention and recited in amended claim 1, the user only needs to replace the replaceable modular system board within the flat panel display device and the remainder of the flat panel display device then can be used for any portable electronic device, such as personal computers, digital television, and DVD players for which a replaceable modular system board is available.

For at least the reasons discussed above, applicants respectfully submit that amended claim 1 is not unpatentable over the Yang patent in view of the Boehme patent, either taken alone or in combination.

Since claim 4 depends on amended claim 1, and because a claim which depends on another claim is subject to all the limitations of that other claim, applicants respectfully submit that claim 4 is not unpatentable over the Yang patent in view of the Boehme patent

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for at least the same reasons discussed above with respect to amended claim 1.


Accordingly, in view of amendments to claim 1, and the remarks above, applicants respectfully request that the rejection of claims 1 and 4 as obvious over the Yang patent in view of the Boehme patent be reconsidered and withdrawn, and that a notice of allowance be issued.

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicants' undersigned attorney invites the Examiner to telephone him at the number provided below.

No fees are deemed necessary in connection with the filing of this Amendment. However, if any additional fees are required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,

I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450	
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